APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,220	10/16/2003	Michael Joseph Carnevale	ROC920030232US1	9461

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/688,220	CARNEVALE ET AL.
	Examiner	Art Unit	
	Leon Andrews	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2007*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

- Applicant's Amendment filed October 15, 2007.

- **Claims 1-2, 8 and 14-20** were amended.

- Examiner's Rejection to **Claims 1-20** is not withdrawn.

1.   **Claims 1-20** are rejected under 35 U.S.C. 102(e) as being anticipated by Haydt (Pub.

No.: US 2004/0019882 A1)

Regarding Claim 1, Haydt discloses a method (methods, paragraph [0010], page 1, line 1)

comprising:

receiving an allocate request from a queue pair (resources referenced (requested) through

a queue pair, paragraph [0054], page 5, lines 2-3);

finding a free buffer in a free pool (in a single operation, a message is queued in a list of

receive buffers (available free buffers), paragraph [0053], page 5, lines 10-12);

determining whether a number of buffers (at startup and at any time all the receive

buffers, paragraph [0053], page 5, line 9) allocatable to the queue pairs is greater than zero (the

appropriate index from the queue pair is added to a buffer key and the resulting value (greater

than zero) is used to index into a key table, paragraph [0035], page 3, lines 6-9);

deciding whether a number of buffers allocated to an operation type (receive buffers all

in a single operation of queuing a credit message, paragraph [0053], page 5, lines 11-12) is less

than a maximum (buffer range fits within the range specified by the key table entry, paragraph [0057], page 5, lines 1-2); and

allocating the free buffer (message queued in a list of receive buffers in a single operation) to the queue pair if the queue pair requests the free buffer for an operation having the operation type (resources referenced through a queue pair associated with a particular application, paragraphs [0053 and 0054], page 5, lines 10-12 and 2-3 respectively) and the determining and the deciding are true.

Regarding Claim 2, Haydt discloses the method of claim 1, further comprising:

receiving a validate request associated with a data transfer (RDMA read generates a queue entry (request) when the data transfer completes, paragraph [0047], page 4, lines 5-6) that uses the free buffer.

Regarding Claim 3, Haydt discloses the method of claim 2, further comprising:

determining whether a requester (Fig. 1, user mode implementation 130) of the data transfer matches the queue pair.

Regarding Claim 4, Haydt discloses the method of claim 2, further comprising:

determining whether a type of the data transfer is valid for the operation type (as processing completes for an operation, a completion queue entry is generated and inserted into a completion queue (showing validity), paragraph [0010], page 1, lines 9-11).

Regarding Claim 5, Haydt discloses the method of claim 1, wherein the determining further

comprises:

determining whether the number of buffers allocatable to the queue pair is greater than a

remaining size of the operation ({receive buffers all in a single operation, paragraph [0053], page

5, lines 11-12} – {operations to process increases, paragraph [0010], page 1, lines 4-5}).

Regarding Claim 6, Haydt discloses the method of claim 1, wherein the operation type is a

transmit (operations like sending {transmit} information, paragraph [0021], page 2, lines 3-4).

Regarding Claim 7, Haydt discloses the method of claim 1, wherein the operation type is a

receive (operations like receiving information, paragraph [0021], page 2, lines 3-4).

Regarding Claim 8, it is the corresponding apparatus claim to method **Claims 1 and 2**.

Therefore, it is rejected for the same reasons explained above.

Regarding Claim 9, it is the corresponding apparatus claim to method **Claim 3**. Therefore, it is

rejected for the same reasons explained above.

Regarding Claim 10, it is the corresponding apparatus claim to method **Claim 4**. Therefore, it is

rejected for the same reasons explained above.

Regarding Claim 11, it is the corresponding apparatus claim to method **Claim 5**. Therefore, it is

rejected for the same reasons explained above.

Regarding Claim 12, it is the corresponding apparatus claim to method **Claim 6**. Therefore, it is

rejected for the same reasons explained above.

Claim 12, the apparatus of claim 8, wherein the operation type is a transmit.

Regarding Claim 13, it is the corresponding apparatus claim to method **Claim 7**. Therefore, it is

rejected for the same reasons explained above.

Regarding Claim 14, Haydt discloses the apparatus of claim 8, further comprising:

   means for deallocating the free buffer if a requester (Fig. 1, user mode implementation

130) matches the queue pair.

Regarding Claim 15, Haydt discloses an adapter (Fig. 1, 150) comprising:

   a free pool of a plurality of entries (valid entries, paragraph [0047], page 4, line 1); and

   a controller (Fig. 2, 250) that receives a plurality of allocate requests from a plurality of

queue pairs (resources referenced through a queue pair, paragraph [0054], page 5, lines 2-3),

finds a plurality of free buffers in the free pool (in a single operation, a message is queue in a list

of receive buffers, paragraph [0053], page 5, lines 10-12), allocates the plurality of free buffers

(at startup and any time all the receive buffers, paragraph [0052], page 5, line 9) from the

plurality of entries in response to the plurality of allocate requests from the plurality of queue

pairs (queue pairs, paragraph [0035], page 3, lines 4-5) if a number of buffers allocated to the

plurality of queue pairs (the appropriate index from the queue pair is added to a buffer key,

paragraph [0035], page 3, lines 6-7) is greater than zero, if a number of buffers allocated to an

operation type (message queued in a list of receive buffers in a single operation and the resources

referenced through a queue pair associated with a particular application, paragraphs [0053 and

0054], page 5, lines 10-12 and 2-3 respectively) is less than a maximum, and if the plurality of

queue pairs request the plurality of free buffers for operations having the operation type,

validates the plurality of free buffers for a plurality of data transfers (data transfer, paragraph

[0047], page 4, line 6), and deallocates at least one of the plurality of free buffers in response to a

shutdown of an associated at least one of the plurality of queue pairs (each queue pair has a

buffer which is queued for delivery when an event occurs and, the buffer is not returned until the

driver responds to the event, paragraph [0041], page 4, lines 1-11).

Regarding Claim 16, Haydt discloses the adapter of claim 15, wherein the controller further

stores status (Fig. 2, 230) in each of the plurality of entries, wherein the status comprises an

indication (Fig. 3A, 332) of whether each of the respective plurality of free buffers is to be used

for a master or a target operation (operations to process increases, paragraph [0010], page 1, lines

4-5).

Regarding Claim 17, Haydt discloses the adapter of claim 15, wherein the controller further

stores status in each of the plurality of entries, wherein the status comprises an indication (Fig.

3A, 332) of whether each of the respective plurality of free buffers is to be used for a RDMA

(RDMA, paragraph [0047], page 4, line 3) or a send operation.

Regarding Claim 18, Haydt discloses the adapter of claim 15, wherein the controller further stores status in each of the plurality of entries, wherein the status comprises an indication (Fig. 3A, 332) of whether each of the respective plurality of free buffers is to be used for a read or a write (RDMA read and write, paragraph [0047], page 4, line 2) operation.

Regarding Claim 19, Haydt discloses the adapter of claim 16, wherein the controller further validates (key table index contains the information for validating the buffer, paragraph [0054], page 5, lines 9-10) the plurality of free buffers based on the status.

Regarding Claim 20, Haydt discloses the adapter of claim 17, wherein the controller further validates the plurality of free buffers based on the status.

Citation of Pertinent Prior Art

2.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Craddock et al. (Pub. No.: US 2003/0061417 A1) discloses infiniband work and completion queue management via head and tail circular buffers with indirect work queue entries.

Arndt et al. (Pun. No.: US 2003/0058875 A1) discloses infiniband work and completion queue management via head only circular buffers.

Neal et al. (Pub. No.: US 2003/0093627 A1) discloses open format storage subsystem

apparatus and method.

Boyd et al. (Pub. No.: US 2004/0049600 A1) discloses memory management offload for

RDMA enabled network adapters.

Response to Arguments

3.   Applicant's arguments filed October 15, 2007 have been fully considered, but they are

not persuasive.

- In the remarks on pages 6 and 7 of the amendment, applicant contends that

  Haydt does not teach or suggest the allocate request, receiving an allocate

  request from a queue pair or finding a free buffer in a free pool as recited in

  claim 1. Further, Haydt does not teach or suggest allocating the free buffer to

  the queue pair if the queue pair requests the free buffer for an operation

  having the operation type and the determining and deciding are true as recited

  in claim 1.

- The examiner respectfully disagrees and contends that Haydt discloses

  resources referenced (requested) through a queue pair, paragraph [0054], page

  5, lines 2-3 and, (in a single operation, a message is queued in a list of receive

  buffers (available free buffers), paragraph [0053], page 5, lines 10-12). Also,

  buffers are supplied to the hardware as incoming messages are received,

  paragraph [0049], page 5, lines 10-12. Further, Haydt discloses message

  queued in a list of receive buffers in a single operation and the resources

referenced through a queue pair associated with a particular application,

paragraphs [0053 and 0054], page 5, lines 10-12 and 2-3 respectively.

- In remarks on page 7 of the amendment, applicant contends that Haydt does

  not teach or suggest all the elements of claim 1. Also, since claims 8 and 15

  are patentable over Haydt since they contain similar elements to claim 1.

  Further, claims 2-7, 9-14 and 16-20 are patentable since they depend on

  claims 1, 8 and 15 respectively.

- The examiner respectfully disagree and contends that regarding claim 1,

  Haydt discloses a method (methods, paragraph [0010], page 1, line 1)

  comprising:

      receiving an allocate request from a queue pair (resources referenced

  (requested) through a queue pair, paragraph [0054], page 5, lines 2-3);

      finding a free buffer in a free pool (in a single operation, a message is

  queued in a list of receive buffers (available free buffers), paragraph [0053],

  page 5, lines 10-12);

      determining whether a number of buffers (at startup and at any time all the

  receive buffers, paragraph [0053], page 5, line 9) allocatable to the queue

  pairs is greater than zero (the appropriate index from the queue pair is added

  to a buffer key and the resulting value (greater than zero) is used to index into

  a key table, paragraph [0035], page 3, lines 6-9);

deciding whether a number of buffers allocated to an operation type (receive buffers all in a single operation of queuing a credit message, paragraph [0053], page 5, lines 11-12) is less than a maximum (buffer range fits within the range specified by the key table entry, paragraph [0057], page 5, lines 1-2); and

allocating the free buffer (message queued in a list of receive buffers in a single operation) to the queue pair if the queue pair requests the free buffer for an operation having the operation type (resources referenced through a queue pair associated with a particular application, paragraphs [0053 and 0054], page 5, lines 10-12 and 2-3 respectively) and the determining and the deciding are true. Further, claims 8, 15, 2-7, 9-14 and 16-20 are not patentable over Haydt

- In remarks on page 8 of the amendment, applicant contends that the claims are in condition for allowance.
- The examiner respectfully disagrees and contends that the claims are not in condition for allowance.

Conclusion

4.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Leon Andrews whose telephone number is (571) 270-1801. The

examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Rao S. Seema can be reached on (571) 272-3174. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LA/la   ∠ A
June 20, 2007

Seema S. Rao 1/7/08
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